NOVEMBER/DECEMBER 2025

23PEPH24C — ADVANCED OPTICS

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Define scattering.
2. What is polarized light?
3. Give types of lasers.
4. Applications of gas lasers.
5. Define optical fiber.
6. What is an index fiber?
7. Principle of self-focusing light.
8. Application of harmonic oscillator.
9. Explain the inverse Zeeman effect.
10. Definition of stark effect?

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Explain double refraction.

Or

(b) Write a short note polarization by scattering.

12. (a) Write down short notes on He – Ne laser.

Or

(b) Explain the semiconductor laser.

13. (a) Explain glass fiber.

Or

(b) Write short notes on single mode fibers.

14. (a) Explain third harmonic generation.

Or

(b) Explain optical mixing.

15. (a) Explain the Faraday effect.

Or

(b) What is Cotton mouton effect?

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Classify polarization and explain transverse character of light waves.

17. Briefly explain ruby laser with neat diagram.

18. Write short notes on :

(a) Attenuation in optical fibers

(b) Parabolic index fibers

19. Write short notes on

(a) Phase matching

(b) Second harmonic generation

20. Discuss about stark effect and inverse stark effect.

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